the surface of all protoplasm; (2) physical considerations lead to belief in a differential surface layer of protoplasm; (3) plasma membrane differs in physical properties and probably in chemical constitution from the protoplasm it bounds; (4) the membrane is of high viscosity, probably a gel, which readily reverts to a liquid sol state; (5) it is capable of ready adjustment to changes in contour and area; (6) protoplasm in most cases forms a membrane almost instantly on the surface; exceptions are due to extreme liquidity; (7) the living membrane is rather delimited from the inner plasma, but it cannot be isolated from it; (8) the degenerated, coagulated plasma membrane can sometimes be isolated, being then of finer consistency, elastic, and exceedingly tough; (9) the nucleus and vacuoles also possess protoplasmic membranes resembling the outer plasma membrane; (10) the thickness of the membrane is probably about 0.1 μ.

Protoplasm, when dissected in water, in most cases is immiscible in it. When it is miscible, it is caused by extreme liquidity or disintegration. The immiscivity is possibly due to the colloidal and chemical nature of the protoplasm. The absorption and retention of water by protoplasm are essentially inhibition processes.—WM. CROCKER.

Food storage in cotyledons.—DUGGAR[20] has found that removal of the cotyledons of the pea seedling at an early stage of growth causes a much slower development of the plant, but their removal after the food is largely withdrawn causes no reduction in growth rate. Removal of the endosperm of the corn has far less effect. Glycocoll and sodium nucleinate in water culture partially substitute for the loss of the cotyledons. Asparaginate and alanin depress the growth with cotyledons removed. The author is to run experiments in sterile conditions to further test the possibility of organic materials substituting for the cotyledons.—WM. CROCKER.

Disease resistance.—MCLEAN[21] concludes that Szinkum mandarin is resistant to citrus canker because its stomata are of such shape as to exclude liquid water and thus stop the entrance of the motile bacterium that produces the canker. The Florida seedling grapefruit which is susceptible to this disease has stomata of about the same size, but they are of such shape as to permit the accumulation of liquid water in the stomata and allow the entrance of the bacterium.—WM. CROCKER.

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[20] DUGGAR, B. M., The nutrition value of food reserve in cotyledons. Ann. Mo. Bot. Gard. **7**:291–298. 1920.

[21] MCLEAN, F. T., A study of the structure of the stomata of two species of *Citrus* in relation to the citrus canker. Bull. Torr. Bot. Club **48**:101–106. 1921.